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Advanced Arithmetic. By E. A. LYMAN. New York: American Book Co., 1905. Pp. 253.

This book is intended for pupils who have completed the grammar-school course in arithmetic. The author has been successful in his aim to develop fundamental principles, and at the same time to include the essentials of commercial arithmetic. The principles of arithmetic are carefully developed, the demonstrations are clearly put, and the problems throughout are practical and well chosen.

The author states that the exercises have been selected largely from actual business transactions. That is to say, the author seems to emphasize the disciplinary value of the subject, and at the same time apply the fundamental principles to the solution of practical business problems. Those of percentage, especially, bear out the author's claim that they have been selected from actual business transactions, or reviewed by business men. In view of this claim, however, it is disappointing not to find, in the earlier part of the book, a larger proportion of problems which represent actual contact at first hand with social, industrial, and business operations.

Constantly throughout the book the pupil is taught to check his work. It is admirable advice to give a pupil, to urge him to form the habit of estimating results before beginning the solution of a problem. It seems unfortunate, however, that the author, in common with the authors of other high-school arithmetics, should recommend the method of checking addition, subtraction, multiplication, and division by the casting out of 9's, instead of the much simpler and more economical method of reducing the different numbers to a single unit.

Attention should be called to the following errors that should be corrected in a future edition: On p. 53 we are told that $\frac{5}{8} \div \frac{3}{8} \times \frac{4}{9} = \frac{3\frac{5}{9}}{4}$ instead of $\frac{1}{4}$. That is, $\frac{5}{8}$ is multiplied by $\frac{4}{9}$ and the product used as a divisor of $\frac{3}{8}$. Again, on p. 87 a problem is solved by means of an equation. We are told to check the result by substituting 90 for x in the original equation. This does not check the result. The substitution should be in the problem. The definition of geometrical progression (par. 326) is misleading.

Historical notes appear from time to time which add to the interest, and furnish valuable insight into the development of the subject.

Finally, this book is well adapted to furnish a practical course in business arithmetic to high-school and normal-school pupils, and deserves a careful examination by anyone selecting such a text book.

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Elementary Algebra. By J. H. TANNER. New York: American Book Co., 1904. Pp. ix+364.

One only needs to read the preface of the present book to become impressed with the many excellent pedagogical points the author has sought to make in the preparation of the book. For example, an introductory chapter seeking to make the work in algebra seem to the pupil a continuous and natural outgrowth of arithmetic is particularly laudable. But this is only one of the numerous ways in which Mr. Tanner recognizes that an important element in the teaching problem is the taught.

From p. 32, just after the introduction and a very teachable chapter on positive and negative numbers, the work begins to take its bearings from the equation. On the whole, one must commend the rational procedure of this book, but the writer can

not longer resist raising the inquiry what advantage certain writers of elementary mathematical texts—Professor Tanner among others—hope to gain in point of logical, or any other sort of completeness, by the following definition of multiplication: “*The product of two numbers is the result obtained by performing upon the first of these numbers (the multiplicand) the same operation that must be performed upon the unit to obtain the second (the multiplier)*”?

Let us see: $5 \times 4 =$ what, on this definition? In this definition nothing is said about how the *unit* is to be “performed upon” to give the 4. I have a perfect right therefore to perform upon it thus: $1^3 + 1^2 + 1^1 + 1 = 4$, in accordance with the law $x^3 + x^2 + x + 1$. Now I must “perform on” the 5 in the same way to get the product. This gives me $5^3 + 5^2 + 5^1 + 5 = 160$. Therefore, in the form stated 5×4 may just as well be 160 as any other number.

Of course, this definition is thoroughly “innocuous” because no high-school pupil ever understands it, and no high-school teacher ever uses it.

The writer would not have the reader believe for a moment that the character of Professor Tanner’s book is in any way epitomized by this pointless attempt to introduce fuller adequacy into the definition of multiplication. Pretty much every writer who is impressed only with the need of logical perfection in the high school has used it, and some go so far as to call high-school teachers to account for not using it. The writer challenges it in Mr. Tanner’s book, because the book possesses so many distinct points of merit that it can easily stand the challenge.

Mr. Tanner’s treatment of factoring is excellent—much superior to the customary treatment. Type-forms typify something to the pupil as he treats them. The book contains many lists of problems, an unusually large number of which have a meaning and are worth solving by high-school boys and girls. Many of the problems are modern in a true sense.

The author evidently does not believe in the early use of graphs in algebra. The book contains nothing before p. 314 on the graph, and this, the writer believes, is unfortunate. Here there are three short sections on “Graphic Representation of Equations.” A chapter on “Mathematical Induction” is a valuable feature. Aside from the rather formal development of topics, and a little too early and too continuous insistence on work by rule, the writer regards this as a good one. To say that it is one of the most teachable books of the Cornell Series is no mean praise.

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BOOKS RECEIVED

(The notice here given does not preclude the publishing of a comprehensive review.)

EDUCATION

Principles of Teaching, Based on Psychology. By EDWARD L. THORNDYKE. New York: A. G. Seiler, 1906. Pp. xii + 293.

HISTORY AND CIVICS

The Making of the American Nation. A History for Elementary Schools. By JACQUES WARDLAW REDWAY. New York: Silver, Burdett & Co., 1905. Pp. xii + 412 + 56.